WHAT IS CLAIMED IS:

1. A position adjusting method of color combining optical system used for producing a projector including a light source, a color separating optical system that separates a light beam irradiated by the light source into a plurality of color lights, an optical component casing that accommodates optical components constituting the color separating optical system, a plurality of optical modulators that modulate the respective color lights separated by the color separating optical system in accordance with image information, and a color combining optical system that combines the light beam modulated by the respective optical modulators to form an optical image, the position adjusting method adjusting the position of the color combining optical system relative to the optical components casing, comprising the steps of:

irradiating a white laser beam on an optical axis of a light beam passing through the optical component casing;

separating the white laser beam by the color separating optical system into the respective color lights to be incident on a light-incident end surface of the color combining optical system and detecting the light beam combined by the color combining optical system by a sensor; and

adjusting the position of the color combining optical system relative to the optical component casing while detecting the combined light.

2. The position adjusting method of color combining optical system according to claim 1, wherein the sensor is a point sensor, and

wherein the completion of the position adjustment is determined while monitoring detection status in the combined light detecting step.

3. The position adjusting method of color combining optical system according to claim 2, wherein the completion of adjustment is determined when the area of the combined light detected by the point sensor becomes the minimum.

4. The position adjusting method of color combining optical system according to claim 2, wherein the color combining optical system includes a prism that combines the

color lights and a fixing plate adhered on the lower side of the prism by a light curing adhesive to be mechanically fixed to the optical component casing,

wherein the position adjusting step is conducted while the light curing adhesive is not cured, and

wherein light is irradiated to the light curing adhesive to cure the adhesive after determining the adjustment completion.

5. The position adjusting method of color combining optical system according to claim 4, wherein the fixing plate has a spherical bulging portion formed on a fixing surface of the prism, and

wherein the position of the prism is three-dimensionally adjusted to the fixing plate while the adhesive is not cured and the prism is in contact with the bulging portion.

6. The position adjusting method of color combining optical system according to claim 5, wherein the light curing adhesive is coated so that the gap between the lower side of the prism and the fixing plate formed by the bulging portion of the fixing plate is filled.

7. The position adjusting method of color combining optical system according to claim 5, wherein the height of the bulging portion of the fixing plate is from 50 to 100% of maximum tolerance of cutting accuracy on the lower side of the prism, and wherein the curvature radius of the bulging portion is set so that the area of the bulging portion is from 1 to 50% of the area of the lower side of the prism.

8. A position adjusting system used for producing a projector having a light source, a color separating optical system for separating a light beam irradiated by the light source into a plurality of color lights, an optical component casing that accommodates optical components constituting the color separating optical system, a plurality of color modulators that modulate the respective color lights separated by the color separating optical system in accordance with image information, and a color combining optical system that combines the light beam modulated by the respective optical modulators to form an optical image, the position adjusting method adjusting the position of the color combining optical system relative to the optical component casing, comprising:

a laser beam irradiator that supplies white laser beam on an optical axis of light beam passing through the optical component casing;

a combined light sensor that causes the respective color lights generated by separating the white laser beam by the color separating optical system to be incident on a light-incident end surface of the color combining optical system and detects the light beam combined by the color combining optical system; and

a position adjuster that adjusts the position of the color combining optical system based on the combined light detected by the combined light sensor.

9. The position adjusting system according to claim 8, wherein the combined light sensor has an adjustment completion determining portion that determines completion of position adjustment of the color combining optical system while monitoring detection status of the combined light.

10. The position adjusting system according to claim 8, wherein the color combining optical system has a color-combining prism and a fixing plate adhered on the lower side of the prism by a light curing adhesive to be mechanically fixed to the optical component casing, and

wherein the position adjuster has a prism holder that holds the prism and a light beam irradiator that irradiates light that cures the light curing adhesive.

11. A color combining optical system including a color-combining prism and a fixing plate adhered on the lower side of the prism by a light curing adhesive to be mechanically fixed to an optical component casing,

wherein the fixing plate has a spherical bulging portion formed on the fixing surface of the prism, and

wherein the prism is adhered on the fixing plate while at least a part of the prism is in contact with the bulging portion.

12. The color combining optical system according to claim 11, wherein the light curing adhesive is coated so that the gap between the lower side of the prism and the fixing plate formed by the bulging portion of the fixing plate is filled.

13. The color combining optical system according to claim 11, wherein the height of the bulging portion of the fixing plate is from 50 to 100% of maximum tolerance of cutting accuracy on the lower side of the prism, and wherein the curvature radius of the bulging portion is set so that the area of the bulging portion is from 1 to 50% of the area of the lower side of the prism.

14. A projector comprising a color combining optical system adjusted by the adjusting method of color combining optical system according to claim 1.

15. A position adjusting system of optical modulator used for producing a projector having a light source, a color separating optical system that separates a light beam irradiated by the light source into a plurality of color lights, an optical component casing that accommodates optical components constituting the color separating optical system, a plurality of color modulators that modulate the respective color lights separated by the color separating optical system in accordance with image information, and a color combining optical system that combines the light beam modulated by the respective optical modulators to form an optical image, the position adjusting system adjusting relative position of the plurality of color combining optical systems, comprising:

an adjuster body onto which an object to e adjusted including the optical modulator and the optical component casing is mounted to adjust position of the respective optical modulators;

a transmissive screen onto which an enlarged image projected from the object to be adjusted is formed;

an image sensor provided on the backside of the transmissive screen to detect the projection image projected on the transmissive screen; and

an optical axis sensor that detects an illumination optical axis set in the optical component casing,

wherein the optical modulator is adjusted by the adjustor body based on the illumination optical axis detected by the optical axis sensor.

16. The position adjusting system of optical modulator according to claim 15, the

optical axis sensor including: a light beam output that outputs a linear light beam along the illumination optical axis; a light beam sensor that detects the light beam irradiated by the light beam output; and an optical axis processor that calculates the position of the illumination optical axis based on the light beam detected by the light beam sensor.

17. The position adjusting system of optical modulator according to claim 15, the adjuster body including: a holder that holds the optical modulator; a position adjuster that adjusts the position of the optical modulator held by the holder; and a light beam feeder that supplies adjusting light beam to the optical modulator, the holder having a light beam transmitting hole that introduces the light beam from the light beam feeder to an image formation area of the optical modulator.

18. The position adjusting system of optical modulator according to claim 17, wherein the optical modulator is fixed on a light-incident end surface of the color combining optical system with a light curing adhesive, and

wherein the holder has a light irradiator that cures the light curing adhesive.

19. A position adjusting method of optical modulator used for producing a projector including a light source, a color separating optical system that separates a light beam irradiated by the light source into a plurality of color lights, an optical component casing that accommodates optical components constituting the color separating optical system, a plurality of optical modulators that modulate the respective color lights separated by the color separating optical system in accordance with image information, and a color combining optical system that combines the light beam modulated by the respective optical modulators to form an optical image, the position adjusting method adjusting the relative position of the plurality of color combining optical systems, comprising the steps of:

irradiating a laser beam along an illumination optical axis established in the optical component casing;

detecting the irradiated laser beam;

calculating the illumination optical axis of the optical component casing based on the detected laser beam; and

adjusting the relative position of the optical modulators based on the position of

the calculated optical axis of the optical component casing.

20. A projector comprising a plurality of optical modulators of which position is adjusted by the position adjusting method of optical modulator according to claim 19.